Claims:

1. A method for transmitting information in a communication system comprising at least a mobile communication network in which information is transferred from one or more transmitting devices to one or more receiving devices at least one training sequence is used in the information transfer, and signals transmitted through at least two antennas are received in the receiving device, wherein a different phase of the same training sequence is used in data frames transmitted through different antennas.

2. The method according to claim 1, wherein the transferred information is divided to be transmitted through at least two antennas to the receiving device, and in the receiving device, an examination is performed for the transmitted information using signals transmitted through different antennas.

3. The method according to claim 2, wherein the transmitting device used is a network element, and the receiving device is a wireless communication device.

4. The method according to claim 1, wherein different signals are transmitted through different antennas, and differentiation of signals transmitted through different antennas is performed in the receiving device.

5. The method according to claim 2, wherein the receiving device used is a network element, in which signals transmitted by at least two wireless communication devices are received, and different phases of the same training sequence are used in at least two of said wireless communication devices.

6. The method according to claim 1, wherein information is transmitted in data frames, which are supplemented with said training sequence.

7. The method according to claim 1, wherein the phase shift of the training sequence used in signals to be transmitted through different antennas is defined by minimizing the interference between the training sequences.

8. The method according to claim 7, wherein the phase shift of the training sequence used in signals transmitted through different antennas is defined by the formula

$$k^* = \arg\max_k 10\log_{10}\left(1 + tr\left\{\mathbf{R}(k)^{-1}\right\}\right)$$

in which $\mathbf{R}(k) = \mathbf{S}(k)^T\mathbf{S}(k)$, in which

$$\mathbf{S}(k) = \begin{bmatrix} s_{i,L} & \cdots & s_{i,1} & s_{i,k+L} & \cdots & s_{i,k+1} \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ s_{i,P+L-1} & \cdots & s_{i,P} & s_{i,k+P+L-1} & \cdots & s_{i,k+P} \end{bmatrix}.$$

9. The method according to claim 1, wherein one transmitting device is in connection with two or more receiving devices, and in signals to be transmitted from said transmitting device to said receiving device, different phases of the same training sequence is used.

10. The method according to claim 9, wherein a training sequence family is selected, and wherein for one network element one of said training sequences is selected at a time.

11. A communication system comprising at least one transmitting device, at least one receiving device, means for transmitting information from the transmitting device to at least one receiving device, in which transmission at least one training sequence is used, and the receiving device comprises means for the reception of the signal transmitted through said at least two antennas, and in data frames to be transmitted through different antennas, a different phase of the same training sequence is used.

12. The communication system according to claim 11, wherein the information to be transferred is divided to be transmitted through at least two antennas to the receiving device, and the receiving device comprises means for examining the transmitted information using signals transmitted through different antennas.

13. The communication system according to claim 12, wherein the transmitting device is a network element, and the receiving device is a wireless communication device.

14. The communication system according to claim 11, wherein through different antennas different signals are transmitted, and wherein the receiving device comprises means for differentiation of signals transmitted through different antennas.

15. The communication system according to claim 12, wherein the receiving device is a network element, having means for receiving signals transmitted by at least two wireless communication devices, and different phases of the same training sequence are used in said at least two wireless communication devices.

16. The communication system according to claim 11, wherein it comprises means for transmission of information in data frames, which are supplemented with said training sequence.

17. The communication system according to claim 11, wherein the phase shift of the training sequence used in signals transmitted through different antennas is defined by minimizing the interference between the training sequences.

18. The communication system according to claim 17, wherein the phase shift of the training sequence used in signals transmitted through different antennas is defined by the formula

$$k^* = \arg\max_k 10\log_{10}\left(1 + tr\left\{\mathbf{R}(k)^{-1}\right\}\right)$$

in which $\mathbf{R}(k) = \mathbf{S}(k)^T\mathbf{S}(k)$, in which

$$\mathbf{S}(k) = \begin{bmatrix} s_{i,L} & \cdots & s_{i,1} & s_{i,k+L} & \cdots & s_{i,k+1} \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ s_{i,P+L-1} & \cdots & s_{i,P} & s_{i,k+P+L-1} & \cdots & s_{i,k+P} \end{bmatrix}.$$

19. The communication system according to claim 11, wherein it comprises means for performing an information transfer from at least one transmitting device to two or more receiving devices, and wherein in the signals transmitted from said transmitting device to said receiving device, different phases of the same training sequence are used.

20. The communication system according to claim 19, wherein a training sequence is selected, and the communication system comprises means for selecting at a time one of said training sequences to one network element.

21. A network element to be used in a communication system, comprising means for transmitting information from the network element to a wireless device, in which the transmission uses at least one training sequence, and from which network element information is transmitted with at least two antennas, wherein in data frames transmitted through different antennas, different phases of the same training sequence are used.

22. A wireless communication device be used in a communication system, comprising at least one network element, means for transmitting information from the network element to a wireless communication device, in which the transmission uses at least one training sequence, and information is transmitted by using at least two antennas, wherein the wireless communication device comprises means for reception of the signal transmitted through said at least two antennas, and in data frames transmitted through different antennas, different phases of the same training sequence are used, wherein the wireless communication device comprises means for performing

channel correction on the basis of the signal transmitted by at least two different antennas and received by the wireless communication device.